REMARKS

This amendment is responsive to the non-final Office Action mailed on May 12, 2005. Claims 1-10 and 25-28 are pending, claim 7 has been cancelled, and claims 1, 3, 6, 8-10, 25, and 28 have been amended. Claim 33 has been added as a new claim. In view of the foregoing amendments, as well as the following remarks, Applicants respectfully submit that this application is in complete condition for allowance and request reconsideration of the application in this regard.

Rejection of Claims Under 35 U.S.C. § 112

Claims 1-10 stand rejected as failing to comply with the written description requirement and for failing to particularly point out and claim the subject matter Applicants regard as the invention. Although Applicants neither agree with the rejection nor wish to acquiesce in the rejection, Applicants have nevertheless amended claim 1 for purposes of clarity. Consequently, Applicants request that the rejection be withdrawn.

Rejections of Claims Under 35 U.S.C. § 102

Claims 25-28

Claims 25-28 stand rejected under 35 U.S.C. § 102(b) as anticipated by Jin et al. (U.S. Patent No. 6,250,984), hereinafter *Jin*. Of these claims, claim 25 is the only independent claim. The Examiner contends that *Jin* shows or teaches all the elements of the rejected claims. Applicants respectfully disagree for the reasons set forth below.

In contrast to claim 25, as amended, *Jin* does not teach, disclose or suggest "at least one nanotube having an end electrically coupled with said first plate and a length that extends from said end vertically into said second plate" and a dielectric layer "coating said at least one carbon nanotube such that said at least one nanotube is electrically isolated from said second plate." *Jin* discloses a first plate (104), nanotubes (103) electrically coupled at a first end with the first plate

(104), a second plate (100A), and a dielectric layer (101A) disposed between the first and second plates (104, 100A). However, the length of each nanotube (103) does not extend into plate (100A) and the nanotubes (103) are not coated by the dielectric layer (101A).

In order for a reference to anticipate the invention in a claim, the reference must teach each and every element in the precise arrangement set forth in the claim. If the reference fails to teach even one of the claimed elements, the reference does not and cannot anticipate the claimed invention. *Jin* fails to disclose or suggest the claimed arrangement for the nanotubes, the first and second plates, and the dielectric layer as set forth in Applicants' claim 25, as amended. For at least this reason, independent claim 25 is patentable over *Jin*. Consequently, Applicants respectfully request that this rejection be withdrawn.

Furthermore, *Jin* provides no suggestion that would motivate a person having ordinary skill in the art to rearrange the disclosed nanotubes, first and second plates, and dielectric layer. *Jin* discloses a field emission display, as opposed to Applicants' semiconductor structure, in which the nanotubes cannot be coated with dielectric coating. Otherwise, the nanotubes in *Jin* could not operate as field emitters. Moreover, Jin describes at column 4, line 5 to column 5, line 3 that the ends of the nanotubes must protrude for the field emission display to operate. Hence, the nanotubes in *Jin* cannot extend into an electrically-conductive structure.

Because claims 26-28 depend from independent claim 25, Applicants submit that these claims are also patentable for at least the same reasons discussed above. Furthermore, these claims recite unique combinations of elements not taught, disclosed or suggested by *Jin*.

Claims 1, 4-8, and 10

Claims 1, 4-8, and 10 stand rejected under 35 U.S.C. § 102(e) as anticipated by Farnworth et al. (U.S. Patent No. 6,858,891), hereinafter *Farnworth*. Of these claims, claim 1 is the only independent claim. The Examiner contends that *Farnworth* shows or teaches all the elements of the rejected claims. Applicants respectfully disagree for the reasons set forth below.

In contrast to claim 1, as amended, *Farnworth* does not teach, disclose or suggest

that the first end of the at least one semiconducting nanotube is coupled with the source and the second end of the at least one semiconducting nanotube is coupled with the drain. Instead, both ends of the nanotube (22) in *Farnworth* are coupled with the annular source (17). The annular drain (21) in *Farnworth* is coupled at a mid-length location of the nanotube (22) that is between the ends of the nanotube (22).

In further contrast to claim 1, as amended, *Farnworth* does not teach, disclose or suggest at least one semiconducting nanotube having "a length extending vertically through said gate electrode between said first and second ends and being electrically insulated from said gate electrode, said gate electrode gating said length when a voltage is applied to said gate electrode to define a channel region for current flow from said source to said drain." In *Farnworth*, an inverted U-shaped central loop of the nanotube (22) vertically above the drain (21) is not gated by the annular gate electrode (19) because both ends of the nanotube (22) are coupled with the annular source (17) and the annular drain (21) is located between the annular source (17) and below the central loop of the nanotube (22). Hence, the channel region of nanotube (22) consists exclusively of the end portions between the annular source (17) and the annular drain (21) and excludes the central loop. As a result, current does not flow through the central loop of nanotube (22) when the nanotube (22) is gated by voltage applied to gate electrode (19). It follows that the channel region of the nanotube in *Farnworth* is not the length of nanotube between the first and second ends that are respectively coupled with the source and drain, as set forth in Applicants' claim 1. For at least these reasons, independent claim 1, as amended, is patentable over *Farnworth*. Consequently, Applicants respectfully request that this rejection be withdrawn.

Furthermore, *Farnworth* provides no suggestion that would motivate a person having ordinary skill in the art to modify the disclosed device structure. The device disclosed in *Farnworth* is a transistor/capacitor cell for use in a DRAM. Hence, a portion of the nanotube (22) must operate as an element of a capacitor cell; in other words, the entire nanotube (22) cannot operate as an element of a transistor. Given the arrangement of the annular source (17) and annular drain (21) and the coupling of both ends of the nanotube (22) to the annular source

(17), any attempt to modify the structure by coupling one end of the nanotube (22) with the source (17) and the other end of the nanotube 22) with the drain (21) would effectively eliminate the capacitor cell from the modified structure. Hence, the structure in *Farnworth* cannot be modified without rendering the device unsatisfactory for its intended purpose and, moreover, changing the principle of operation of the device. Under MPEP § 2141.03, this would not be permitted.

Because claims 4-8 and 10 depend from independent claim 1, Applicants submit that these claims are also patentable for at least the same reasons discussed above. Furthermore, these claims recite unique combinations of elements not taught, disclosed or suggested by *Farnworth*.

Rejection of Claims Under 35 U.S.C. § 103

Claims 2, 3, and 9 stand rejected under 35 U.S.C. § 103(a) as unpatentable over *Farnworth*. Because these claims depend from independent claim 1, Applicants submit that these claims are also patentable for at least the same reasons discussed above. Furthermore, claims 2, 3, and 9 each set forth unique subject matter not disclosed or suggested by *Farnworth*. Consequently, Applicants request that this rejection be withdrawn.

New Claim

Claim 23, which is new, depends from a patentable independent claim 1 and is patentable for at least the same reasons as claim 1. Furthermore, this claim recites a unique combination of elements not disclosed or suggested by the references of record.

Conclusion

Applicants have made a bona fide effort to respond to each and every requirement set forth in the Office Action. In view of the foregoing amendments and remarks, this application is submitted to be in complete condition for allowance and, accordingly, a timely notice of

allowance to this effect is earnestly solicited. In the event that any issues remain outstanding, the Examiner is invited to contact the undersigned to expedite issuance of this application.

Applicants do not believe fees are dues in connection with filing this communication. If, however, any fees are necessary as a result of this communication, the Commissioner is hereby authorized to charge any under-payment or fees associated with this communication or credit any over-payment to Deposit Account No. 23-3000.

Respectfully submitted,

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Date

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